CLAIMS

1. Method of charging several electrochemical cells (5, 6, 7), in particular Lithium-Polymer cells, connected in series to a charger (1) which allows adjusting the voltage and the charging current, the method comprising permanently detecting the voltage of each cell and when a cell reaches a predetermined threshold voltage, shunting the current of that cell, characterised by, when a first cell reaches the threshold voltage, applying an increment to the charging current of said several cells (5, 6, 7) and simultaneously connecting in parallel to said cell, a shunt resistor of a current equivalent to the increment of the charging current of said several cells (5, 6, 7), and by, when each of the subsequent cells reaches said threshold voltage, connecting also in parallel to each cell, a shunt resistor of a current equal to the increment in the charging current of said several cells (5, 6, 7).

2. Method of charging several electrochemical cells according to claim 1, characterised in that from the time when the increment is applied to the charging current of said several cells, if the non-shunted part of the current results in overcharging in one of the cells which has reached the threshold voltage, applying at least one decrement to the charging current until the voltage of said cell is again equal to the threshold voltage.

3. Method according to one of claims 1 or 2, characterised in that the current which is shunted comprises between 1% and 30%, and preferably between 5% and 15% of the charging current of all the cells (5, 6, 7).

4. Method according to claim 3, characterised in that the charging current of all the cells (5, 6, 7) is calculated as a function of the temperature of each of the cells.

5. Method according to claim 4, characterised in that if the temperature of at least one of the cells is outside a desired range of temperatures, the cells are heated or allowed to cool until their temperature is in the desired range.

6. Method according to claim 5, characterised in that the range of temperatures is between 40°C and 110°C, and preferably between 50°C and 100°C.

7. Method according to one of the claims 1 to 6, characterised in that the charging current is calculated according to the formula:

I_charge = A exp $\left[\frac{-B}{2T}\right].S$ where S is the free surface of the cells being charged, A is between 80 $\frac{mA}{cm^2}$ and 150 $\frac{mA}{cm^2}$, and preferably between 105 $\frac{mA}{cm^2}$ and 110 $\frac{mA}{cm^2}$ and B is between 4200 K and 4800 K, and preferably between 4400 K and 4600 K.

8. Method according to claim 7, characterised in that the surface capacitance of each cell is calculated according to the formula Cmax_charge=$\frac{(\alpha T+\beta).S}{I\_charge}$ where α is equal to 0.01 $\frac{mA^2}{Kcm^4}$ and β is between 3.3 $\frac{mA^2}{cm^4}$ and 3.2 $\frac{mA^2}{cm^4}$, and preferably between 3.24 $\frac{mA^2}{cm^4}$ and 3.26 $\frac{mA^2}{cm^4}$, and S is the surface of each cell expressed in cm^2 and I_charge is the charging current according to the formula of claim 7, and in that the charging time is between 5 and 15 hours, preferably between 7 and 10 hours.

9. Method according to claim 8, characterised in that before one cell has reached the threshold voltage and while the voltage difference between

this cell and a cell which has a voltage of minimum charge is greater than a predetermined value, a part of the charging current of this cell is shunted.

10. Method according to claim 9, characterised in that said voltage difference is between 10 mV and 200 mV.

11. Device for charging several electrochemical cells (5, 6, 7), in particular Lithium-Polymer cells, connected in series to a charger (1) which allows adjusting the voltage and the charging current, for implementing the method according to one of claims 1 to 10, said device comprising means (21, 22, 23) for detecting the voltage in each cell, means (15, 16, 17) for shunting the current of each cell, means (12, 13, 14) for connecting the shunting means to each cell (5, 6, 7), characterised in that it further comprises means (18, 19, 20), for comparing the voltage of each cell with a threshold voltage, means (24) for applying an increment to the charging current of the said several cells (5, 6, 7) when the voltage in one of the said several cells (5, 6, 7) reaches a threshold voltage and means (15, 16, 17) for shunting a part of the current equivalent to the increment.

12. Device according to claim 11, characterised in that the means for detecting the voltage of each cell comprises a voltage sensor (21, 22, 23), associated with each cell, the means for shunting the current of each cell comprises a resistor (15, 16, 17), associated with each cell, the means for connecting the shunting means comprises a switch (12, 13, 14), associated with each cell, the means for comparing the voltage comprises a voltage sensor (21, 22, 23) associated with each cell and connected to a control unit (24), which operates said switches (12, 13, 14), the means for applying an increment of the charging current comprising said control unit (24).

13. Device according to claim 12, characterised in that the control unit (24) further comprises means for comparing the outputs of temperature sensors (25, 26, 27) of each cell (5, 6, 7) to a threshold temperature.